ENGLISH TRANSLATION OF:

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Note: In Belgium, only a formal examination is being made. No examination is performed on novelty and inventive step. No opposition procedure is available. Only revocation at the court is possible.

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Floor covering consisting of hard floor panels and process for the manufacturing of such floor panels.

This invention relates to a floor covering consisting of hard floor panels, as well as a process for the manufacturing of such floor panels.

In the first place the invention is meant for so-called laminated floors, though in general it can also be applied to other kinds of floor covering, which consist of hard floor panels, such as veneer parquet, ready-to-lay parquet or other floor panels which are comparable to laminated floor.

It is known that such floor panels can be applied in different ways.

According to a first possibility the floor panels are applied to the underlying bottom, either by glueing together or by nailing. This technique has the disadvantage of being rather laborious and that afterwards changes can only be made by breaking away the floor panels.

According to a second possibility the floor panels are laid loosely onto the ground, the floor panels fitting together by means of a tooth and groove coupling, in which mostly also tooth and groove are glued together. The floor obtained in this way, also called floating parquet, has the advantages of being easy to lay and that the entire floor surface is moveable, which is often favourable to overcome possible phenomena of expansion and shrinkage.

A disadvantage of a floor covering of the above mentioned type, especially when the floor panels are laid loosely onto the ground, exists in the fact that when the floor expands and then shrinks back the floor panels themselves can slide apart, which creates unwanted gaps, for example when the glued connections break.

To remedy this disadvantage, techniques were already thought of in which metal connecting elements are applied between the different floor panels to keep them together. Such connecting elements are however quite

expensive to produce and moreover the application thereof, or the installation thereof, is a time-consuming activity. The invention aims at a floor covering which does not have the afore-mentioned disadvantages.

The invention also aims at a floor covering which has the advantage that no faults, such as cracks and the like, can be created in the laying.

The invention further aims at a floor covering in which the formation of cracks is excluded, if not optimally counteracted, also minimising the chance of penetration of dirt or moisture.

To this purpose the invention relates to a floor covering consisting of hard floor panels which are at least at the edges of two opposite sides provided with co-operating coupling parts, mainly in the form of a tooth and a groove, characterised in that the coupling parts are provided with integrated mechanical locking means, which prevent two coupled floor panels from sliding apart in a direction perpendicular to the edges concerned and parallel to the bottom side of the coupled floor panels; that the coupling parts and locking means are constructed in one piece with the core of the floor panels; that the coupling parts have such a shape that two successive floor panels can exclusively be joined together by clicking and/or rotating, in which each next panel can be laterally joined to the former; that the coupling parts provide a play-free locking in all directions in the plane perpendicular to the afore-mentioned edges; that the possible difference between the upper lip and the lower lip of the lips which delimit the afore-mentioned groove, measured in the plane of the floor panel and perpendicular to the longitudinal direction of the groove, is smaller than once the total thickness of the floor panel; that the total thickness of each floor panel concerned is larger than or equal to 5 mm; and that the basic material of the floor panels, from which the afore-mentioned core and the locking means are formed, consists of a ground and by means of a binding agent or by fusing into one mass combined product

and/or of a product with a base of plastic material and/or of a chipboard with fine chips.

Because of the fact that the coupling parts are provided with a play-free locking, as well as the fact that these coupling parts are constructed in one piece from the basic material of the floor panels, a perfect connection between adjoining floor panels can always be guaranteed, even with repeated expansion and shrinkage of the floor surface.

According to a preferred embodiment the floor panels consist of oblong panels and the previously described coupling parts are provided along the longitudinal sides of these panels.

According to a special embodiment also the other two sides are provided with coupling parts, whether or not of a different construction as described above.

In the most preferable embodiment the afore-mentioned ground and by means of a binding agent into one mass combined product will be used as basic material. More particularly finely ground wood which is preferably glued together, more particularly glued indelibly, will be used for the core. Even more particularly so-called HDF-board (High Density Fireboard) or MDF-board (Medium Density Fireboard) will be used for the core.

The fact that the invention is applied to floor panels whose basic material consists of the previously described material, has the advantage that in the processing of this material very smooth surfaces are obtained, so that very precise couplings can be realised, which is especially important in the case of a play-free click connection and/or turn connection. Also very particular shapes of coupling parts can easily be accomplished, as the afore-mentioned material types can very easily be processed.

The inventor has also noticed that the afore-mentioned materials, particularly HDF and MDF, have ideal properties to realise a connection as

described, as these materials have the right properties as to elastic deformation to, on the one hand, realise a click-effect and, on the other hand, cushion expansion and shrinkage forces in an elastic manner, without causing the floor panels to spring apart or to be damaged irrevocably.

In the case of using a material with a base of plastic for the core, both a solid plastic and a mixture of plastic, possibly composed of recycled materials, can be used.

The floor covering is preferably formed by connecting the floor panels in a glue-less manner. Furthermore the connections are of such nature that the floor panels can be separated again without damaging them, so that for example they can be taken along in the case of a move and be replaced. However, it is clear that a glueing together of tooth and groove is not excluded.

The invention further relates to a process for the manufacturing of the afore-mentioned floor panels which has the advantage that the teeth and/or grooves, including the locking means which belong to them, without problems can be applied to a high production rate in the floor panels. More particularly it aims at a process which permits the rather complicated shapes of the tooth and the groove of the afore-mentioned floor panels to be completely realised with milling cutters whose diameter can be chosen independently from the shape which has to be realised, so that the use of small cutters, for example end mills, with diameters smaller than the depth of the groove or tooth can be excluded.

To this purpose the process shows the feature that the tooth and/or groove are realised by means of a milling process with at least two successive cutter motions by means of cutters which are set up in different angles in respect to the floor panel concerned. During each of the afore-mentioned cutter motions each time mainly the ultimate shape of one side, of either tooth or groove, is realised.

So, for the afore-mentioned two cutter motions cutters are used which extend beyond the groove, respectively the tooth. More particularly the diameters of these cutters will be at least 5 times and preferably even at least 20 times larger than the thickness of the floor panels.

The use of cutters with the afore-mentioned diameters has the advantage that the normal production rates can be maintained which are also applied for cutting a classic straight tooth and groove. Also the advantage arises that the installation of such cutters involves no or few additional costs, as such cutters can be directly placed on a motor shaft and/or the usual machines can be applied.

In view of a better demonstration of the features of the invention, a few preferred embodiments are described below as an example without any restricting quality. Reference is given to the enclosed drawings, in which:

- figure 1 is a floor panel of a floor covering according to the invention;
- figure 2 shows a larger scale section according to line II-II in figure 1;
- figures 3 and 4 show how two floor panels with coupling parts fit into each other according to figure 2;
- figure 5 shows a larger scale section according to line V-V in figure 1;
- figures 6 and 7 show how two floor panels with coupling parts fit into each other according to figure 5;
- figures 8 to 11 show some other variants of coupling parts of floor panels according to the invention;
- figure 12 schematically shows how the floor parts can be provided with coupling parts;
- figure 13 shows a section according to line XIII-XIII in figure 12;
- figures 14 to 21 on a larger scale and in section show the interference of the cutters which are indicated with the arrows F14 to F21 in figure 12;

The invention relates to a floor covering which is composed of hard floor panels 1, for example as depicted in figure 1.

These floor panels 1 can be of a different shape, for example rectangular or square, or of any other shape.

In the most preferred embodiment they will be constructed in an oblong form, as depicted in figure 1, for example with a length from 1 to 2 meters. The thickness can of course also vary, but preferably measures from 0.5 to 1.5 cm, and more particularly 0.8 cm.

Each floor panel 1 is at least at the edges of two opposite sides 2-3 provided with coupling parts 4-5, which permit the coupling together of two adjoining floor panels 1.

According to the invention the coupling parts 4-5, as shown by the figures 2 to 4, are provided with integrated mechanical locking means 6 which prevent two coupled floor panels 1 from sliding apart in a direction D perpendicular to the edges 2-3 concerned and parallel to the bottom side 7 of the coupled floor panels 1; the coupling parts 4-5 and locking means 6 are constructed in one piece with the core 8 of the floor panels 1; the coupling parts 4-5 have such a shape that two successive floor panels 1 can exclusively be joined together by clicking and/or rotating, in which each next panel can be laterally joined to the former; and that the coupling parts 4-5 provide a play-free locking in all directions in the plane perpendicular to the afore-mentioned edges.

In the case of floor panels 1 with an oblong shape, as depicted in figure 1, the coupling parts 4-5 concerned are located on the longitudinal sides 2-3.

The coupling parts 4-5 can be constructed in different forms, although the basic forms of these will always be formed by a tooth 9 and a groove 10.

In the embodiment of figures 2 to 4, the floor panel 1 concerned is provided with coupling parts 4-5 and locking means 6 which permit two floor

panels 1 to be joined together by means of a rotation, without the occurrence of any click-effect.

The locking means 6 in the given example consist of a first locking element 11, formed by a protrusion with a curved convex shape at the bottom side 12 of the tooth 9, and a second locking element 13, formed by a recess with a curved concave shape in the lower wall 14 of the groove 10.

The locking elements 11-13 make sure that two connected floor panels 1 cannot perform a sidelong movement in the horizontal plane in relation to each other.

In order to obtain that two floor panels 1 can be slid into each other by means of a rotation, the curves are preferably of a circular shape. The bottom side 12 shows a curvature with radius R1 the centre of which coincides with the corresponding top edge 15 of the floor panel 1, whereas the lower wall 14 shows a curvature with radius R2, equal to R1, but the centre of which coincides with the corresponding top edge 16. Also radii R1 and R2 can be applied which are larger or smaller than the distance to the top edge 15, respectively 16 and/or which mutually differ in size.

The top side 17 of the tooth 9 and the upper wall 18 of the groove 10 are preferably flat and are situated in the horizontal plane.

The sides on end 19 and 20 of the tooth 9 and the groove 10 of two connected floor panels do preferably not link up, so that a space 21 is formed in between into which possible dust remains or the like can be pressed away by the tooth 9.

The tooth 9 and the groove 10 preferably have complementary shapes, so that the tooth 9 in the coupled state of two floor panels 1 links up precisely to the upper wall 18 and the lower wall 14 of the groove 10, as a result of which a pressure P is exerted on the upper lip 22, cushioned not only by this lip 22, but by the whole structure, as this pressure can propagate through the tooth 9 and the lower lip 23.

It is clear that a number of small deviations from these complementary shapes can occur which have however no or little influence on the cushioning and transferring of pressure forces. Like this, for example a bevel 24 and a recess 25 can be provided, as depicted in the figures 2 to 4, by which is obtained that the successive floor panels 1 can easily be slid into each other, without possible burrs or the like hampering the good connection.

As shown in the figures 5 to 7 the floor panels 1 according to the invention can also be provided with coupling parts 28-29, which also show locking means 30, along the sides 26-27 which are perpendicular to the sides 2-3. The coupling parts 28-29 are preferably also constructed in the form of a tooth 31 and a groove 32. The locking means 30 here do not have to be of the same nature as the locking means 6.

Preferably, on the sides 26-27 locking means are used which permit a joining and locking only by a translation T as depicted in the figures 6 and 7. The locking elements 30 for this purpose consist of a click connection with locking elements 33 and 34 which engage behind each other.

As depicted in the figures 5 to 7 the locking element 33 preferably consists of a protrusion on the bottom side 35 of the tooth 31 which can take place in a recess 36 in the lower wall 37 of the groove 32. The locking element 34 is formed by the upright part which delimits the recess 36.

The locking elements 33-34 in this case have contact planes 38-39 which are parallel to each other and preferably extend slanting, in a direction which facilitates the clicking together. Therefore the tangent line L which is determined by the contact planes 38-39 makes an angle A with the bottom side 7 which is smaller than 90°.

The locking elements 33-34 are preferably provided with bevels 40 and 41 which co-operate in the joining of two floor panels 1 so that the

locking means 33-34 can easily be pushed over each other until they engage behind each other by means of a click-effect.

The thickness W1 of the tooth 31 with the width W of the groove 32, so that the upper lip 42 upon exerting a pressure P is supported by the tooth 31, which is in its turn supported by the lower lip 43.

Analogous to the bevel 24 and the recess 25, also on the edges 28-29 a recess 44 and a bevel 45 are provided.

It is noted that such a click connection can also be applied to the edges 2-3. This can be a click connection analogous to the one of the figures 5 to 7, but this can also be a click connection in which other forms of coupling parts are used, for example as shown in the figures 8 and 9. Contrary to the locking elements 33-34, which consist of rather local protrusions, in the embodiments of the figures 8 and 9 use is made of locking elements 46-47 which extend over a fairly large distance in comparison with the total width B of the coupling.

The locking elements 46-47 are in this case also provided on the bottom side 12 of the tooth 9 and the lower wall 14 of the groove 10.

According to figure 8 the locking elements 46-47 show contact planes 48-49 which are perpendicular to the plane of the floor panel 1. This leads to a very firm coupling.

As shown in figure 9 the locking elements 46-47 can possibly constructed in such a way that mainly only a line contact is formed, for example by constructing the contact planes which face each other with different curvatures.

For this purpose the laterally facing planes of the locking elements 46-47 consist of curved planes. The tangent line L makes an angle A which is smaller than 90°, and preferably even smaller than 45°.

The locking element 46 preferably has two parts with a different curvature, on the one hand a part 50 with a steep slope and, on the other

hand, a part 51 with a weak slope. The part 50 with the steep slope makes sure that a firm coupling is formed. The part 51 with the weak slope permits the coupling parts 4-5 to be joined easily. The space S forms a space which gives room to dust and the like which possibly ends up there when two floor panels 1 are joined together.

In the case of a click connection, for example a connection as shown in the figures 7 to 9, the tooth 9-31 preferably shows a downwardly thickening shape which can co-operate with a widening in the groove 10.

In figure 10 a variant is shown in which at least at the location of the top edges 15-16 a sealing material 52 is provided, by which a waterproof sealing can be ensured. This sealant 52 can consist of a strip or covering which is provided beforehand on the floor panel 1, or on one or both top edges 15-16.

In figure 11 another variant is shown, in which the locking means 6 are formed by an upright part 53 on the tooth 9, which ends up behind a downwards pointing part 54 and is part of the upper wall 18. More particularly this is realised by constructing the top side 17 and the upper wall 18 with a curvature R3 of which the centre is located on the edges 15-16 and constructing the bottom side 12 and the lower wall 14 with a radius R4 of which the centre is also located on respectively the edges 15 and 16. These radii R3-R4 can also be chosen in a different manner.

In general, according to the invention the difference between on the one hand the radius R1, respectively R3, and on the other hand the radius R2, respectively R4, will preferably not be larger than 2 mm.

It is also preferred that the centre of these radii is located inside the circle C1, respectively C2, which extends itself with a radius of 3 mm around the top edge 15, respectively 16, as for example depicted in figure 2.

Finally it is noted that, according to the invention the lower lip 23-24 as shown in the figures 5 to 7 can be constructed longer than the upper lip

22-42. This has the advantage that the coupling parts 4-5-28-29 can be realised more easily by means of a cutter or the like. Furthermore this facilitates the joining together of two floor panels 1, as each next floor panel 1 in the attaching can be laid onto the protruding lower lip 23-43, by which the tooth 9-31 and the groove 10-32 are automatically positioned opposite each other.

The constructions in which the lower lip 23 is equal to, or shorter than, the upper lip 22 then again have the advantage that on the utmost edge of the floor no protruding lip 23 remains which can cause trouble in the finishing.

To permit a swift assembly, to ensure the necessary stability and solidity and to keep the amount of material which has to be cut out limited, the difference E between the upper lip 22-42 and the lower lip 23-43, measured in the plane of the floor panel and perpendicular to the longitudinal direction of the groove 10, will preferably be held smaller than once the total thickness F of the floor panel 1. This total thickness F will normally never be smaller than 5 mm for reasons of stability.

According to a special embodiment the axial line M1 through the tooth 9 and the groove 10 is located below the middle M2 of the floor panel 1, so that the upper lip 22-42 is thicker than the lower lip 23-43. This is mainly important with this type of connections, because then the lower lip 23-43 bends, so that the top side of the floor panel 1 remains free of possible deformations.

As is explained in the introduction, for the core 8 a material is chosen from the following list:

- a ground and by means of a binding agent or by fusing into one mass combined product;
- a product with a base of a plastic material;
- a chipboard with fine chips.

The invention proves, because of the in the introduction explained reasons, especially its use with laminated parquet.

As given by the examples of the figures 2 to 11 such laminated parquet preferably consists of a core 8 from MDF-board, HDF-board or the like, on the top side of which at least one or more material layers are provided.

More particularly it is preferred that the laminated parquet is provided with a design layer 55 and a protecting top layer 56. The design layer is a layer impregnated with resin, for example from paper, which can be printed in all sorts of patterns, such as a wood pattern, a patters in the shape of stone, cork or the like or even in a fancy pattern. The protecting top layer 56 preferably also consists of a layer from a transparent material, saturated with resin, for example melamine resin.

It is clear that other layers can be applied, such as an intermediate layer 57 onto which the design layer 55 is applied.

Preferably also a bottom layer 58 will be applied to the bottom side 7 which forms a counterweight to the top layers and as such ensures the form stability of the floor panel 1. This bottom layer can consist of a with resin, for example a melamine resin, impregnated material, for example paper.

As shown schematically in figure 12 the tooth 9 and the groove 10, and preferably also the tooth 31 and the groove 32, are provided by means of a milling process. In the case that on all four sides a profile needs to be provided, the floor panels 1 will preferably be moved according to two motions V1 and V2 in right angle, during one of which profiles are provided at two opposite edges, in this case the longitudinal edges, by means of milling machines 59-60, while during the other motion profiles are provided at the other edges, in this case the edges on end, by means of milling machines 61-62. During these treatments the floor panels 1 preferably lie with the design layer face downwards.

According to an important feature of the invention each tooth 9-31 and groove 10-32 concerned is realised by means of a milling process with at least two cutter motions by means of cutters which are set up in different angles in respect to the floor panel 1 concerned.

This is clarified in the figures 13, 14 and 15, by which is shown how a groove 10 is realised by means of two cutter motions with the help of two cutters 63 and 64. Figures 16 and 17 show how the tooth 9 is realised by means of cutters 65 and 66.

The figures 18-19 and 20-21 show similar views, which show how the groove 32 and the tooth 31 are realised with cutters 67-68 and 69-70 which are set up in angles.

During each of the afore-mentioned cutter motions each time mainly the ultimate shape of one side is realised. Like this, for example the cutter 63 of figure 14 determines the ultimate shape of the lower side 71 of the groove 10, whereas the cutter 64 determines the ultimate shape of the upper side 72.

As mentioned in the introduction preferably cutters 63 to 72 will be used which have diameters G which are at least 5, and better still 20 times larger than the thickness F of the floor panels 1.

Besides the mentioned cutters preferably also other cutters are used, for example during a first pre-treatment to already remove part of the material which has to be removed.

Today's invention is by no means limited to the embodiments described in the examples and shown by the figures, though such floor covering and the accompanying floor panels 1 can be realised in different shapes and sizes without exceeding the scope of the invention.

Like this, for example the different features which are described by means of the given embodiments can or cannot be mutually combined.

Claims

1. Floor covering, consisting of hard floor panels (1) which are at least at the edges of two opposite sides (2-3) provided with co-operating coupling parts (4-5), mainly in the form of a tooth (9) and a groove (10), characterised in that the coupling parts (4-5) are provided with integrated mechanical locking means (6) which prevent two coupled floor panels from sliding apart in a direction (R) perpendicular to the edges concerned (2-3) and parallel to the bottom side (7) of the coupled floor panels (1); that the coupling parts (4-5) and locking means (6) are constructed in one piece with the core (8) of the floor panels (1); that the coupling parts (4-5) have such a shape that two successive floor panels (1) can exclusively be joined together by clicking or rotating, in which each next panel can be laterally joined to the former; that the coupling parts (4-5) provide a play-free locking in all directions in the plane perpendicular to the afore-mentioned edges; that the possible difference (E) between the upper lip and the lower lip of the lips (22-23) which delimit the afore-mentioned groove (10), measured in the plane of the floor panel (1) and perpendicular to the longitudinal direction of the groove (10), is smaller than once the total thickness (F) of the floor panel (1); that the total thickness (F) of each floor panel concerned (1) is larger than or equal to 5 mm; and that the basic material of the floor panels (1), from which the afore-mentioned core (8) and the locking means (6) are formed, consists of a ground and by means of a binding agent or by fusing into one mass combined product and/or of a product with a base of plastic material and/or of a chipboard with fine chips.

2. Floor covering according to claim 1, characterised in that the basic material, consists of HDF-board or MDF-board, from which the coupling parts (4-5, 28-29) and the locking means (6) are formed.

3. Floor covering according to one of the preceding claims, characterised in that the floor panels (1) consist of oblong panels and that the

afore-mentioned coupling parts (4-5) are located on the longitudinal sides (2-3).

4. Floor covering according to one of the preceding claims, characterised in that the locking means (6) mainly consist of a locking element (11-33-46) in the form of a protrusion which is provided at the bottom side of the tooth (9) and a locking element (13-34-47) which is provided at the lower wall (14) of the groove (10) and has the form of a recess (36) and/or an upright part which is delimited by this recess (36).

5. Floor covering according to claim 4, characterised in that the locking elements (11-13-46-47) in section show a curved shape.

6. Floor covering according to claim 5, characterised in that the bottom side (12) shows a curvature with a radius (R1) of which the centre coincides with the accompanying top edge (15) of the floor panel (1) and the lower wall (14) of the groove (10) shows a corresponding curvature with radius (R2) which is equal to the afore-mentioned radius (R1) of the tooth (9).

7. Floor covering according to claim 5, characterised in that the difference between, on the one hand, the radius of the curvature at the tooth and, on the other hand, the radius of the curvature at the groove has a maximum of 2 mm and that each respective centre which belongs to these radii is located inside the circles (C1-C2) which extend with a radius (R5) of 3 mm around the accompanying top edges (1-16).

8. Floor covering according to one of the preceding claims, characterised in that the coupling parts (4-5) and the locking means (6) are formed from a tooth (9) and a groove (10) whose forms are generally complementary.

9. Floor covering according to claim 5, characterised in that the coupling parts (4-5) are provided with locking elements (33-34-46-47) which permit a click connection.

10. Floor covering according to claim 9, characterised in that the locking elements (33-34-46-47) are constructed in such a way that the tangent line (L) which is determined by their contact planes makes an angle (A) with the bottom side (7) of the floor panels, which is smaller than 90°.

11. Floor covering according to claim 10, characterised in that the locking elements (46-47) provide a line contact, due to the fact that the contact planes which face each other are constructed with different curvatures.

12. Floor covering according to claim 11, characterised in that the bottom side (12) of the tooth (9) has at least two parts (50-51) with a different curvature, respectively a part (50) with a steep slope which takes care of the locking, and a part (51) with a weak slope which facilitates the sliding into each other of the coupling parts (4-5).

13. Floor covering according to one of the preceding claims, characterised in that the floor panels (1) are also on the sides (26-27) perpendicular to the afore-mentioned sides (2-3) provided with coupling parts (28-29) and that these coupling parts (28-29) fit together through a click connection.

14. Floor covering according to one of the preceding claims, characterised in that the coupling parts (4-5, 28-29) are constructed in the form of a tooth (9-31) and a groove (10-32) and that the lip (23-24) which delimits the bottom side of the groove (11-32) extends beyond the lip (22-42) which delimits the top side of the groove (10-32).

15. Floor covering according to one of the preceding claims, characterised in that the floor panels (1) are constructed as laminated parquet; one or more layers, among which a design layer (55), being applied onto the core (8) and a bottom layer (58) being provided on the bottom side (7).

16. Floor covering according to one of the preceding claims, characterised in that the floor panels (1) are connected to each other in a glue-less manner, so that they can be separated and re-used.

17. Process for the manufacturing of floor panels as described in one of the preceding claims, characterised in that the tooth (9-31) and/or the groove (10-32) are realised by means of a milling process with at least two successive cutter motions by means of cutters (63-64-65-66-67-68-69-70) which are set up in different angles in respect to the floor panel (1) concerned.

18. Process according to claim 17, characterised in that during each of the afore-mentioned cutter motions each time mainly the ultimate shape of one side (71-72), of either tooth or groove, is realised.

19. Process according to claim 17 or 18, characterised in that for the two afore-mentioned cutter motions cutters (63-64-65-66-67-68-69-70) are applied which extend beyond the groove (10-32), respectively tooth (9-31), and more particularly also have diameters (G) which are at least 5 times larger than the thickness (F) of the floor panels (1).

20. Process according to claim 19, characterised in that the afore-mentioned two cutters (63-64-65-66-67-68-69-70) have diameters (G) which are at least 20 times larger than the thickness (F) of the floor panels (1).

21. Process according to one of the claims 17 to 20, characterised in that on all four sides of the floor panel (1) a profile is provided, and that the floor panels (1) are moved according to two motions (V1-V2) at right angles, during one of which profiles are provided at two opposite edges, while during the other motion profiles are provided at the edges on end.